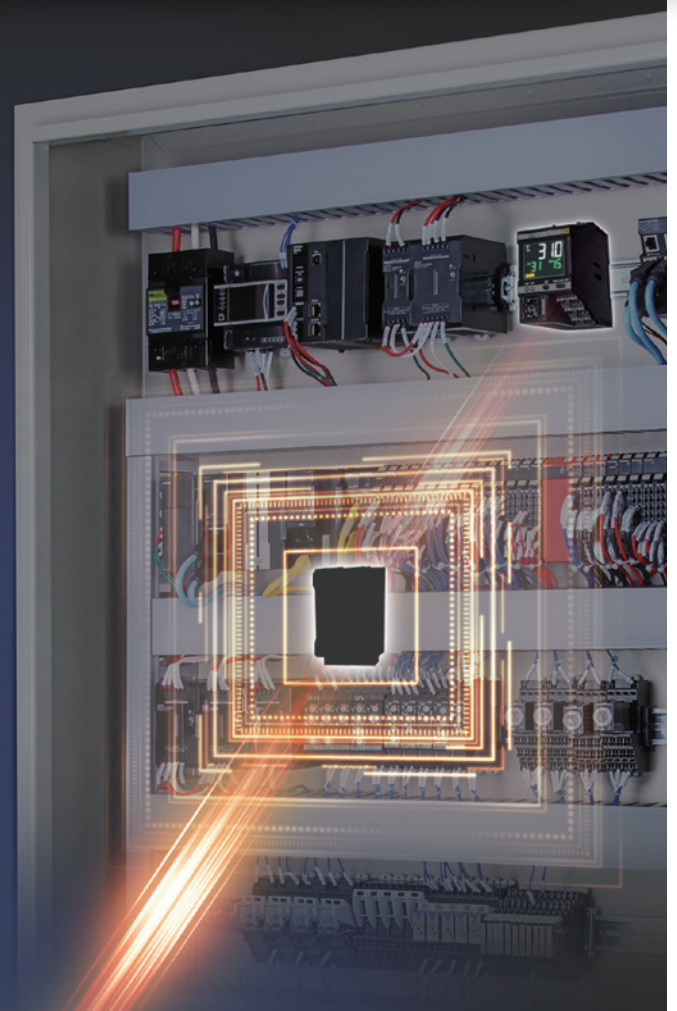


# Panel condition monitoring device

K6PM

Into the new era of  
maintenance by IoT



# Remote monitoring with realtime analysis of the panel status IoT change the style of maintenance

## Contributing to "Zero-downtime" of facilities and equipment.

A shortage of human maintenance resources can lead to a device failure in a panel, which will increase a risk of serious accidents or facilities stop.  
OMRON proposes you a new way of maintenance where every panel in your plant is under surveillance without human resource through the constant temperature monitoring powered by IoT.

Reduce both of maintenance labor and risk of abnormal stop by the maintenance utilizing constant remote monitoring

### Skillless

Our unique algorithm will allow inexperienced personnel to recognize an abnormality and to maintain without help from skilled engineers.

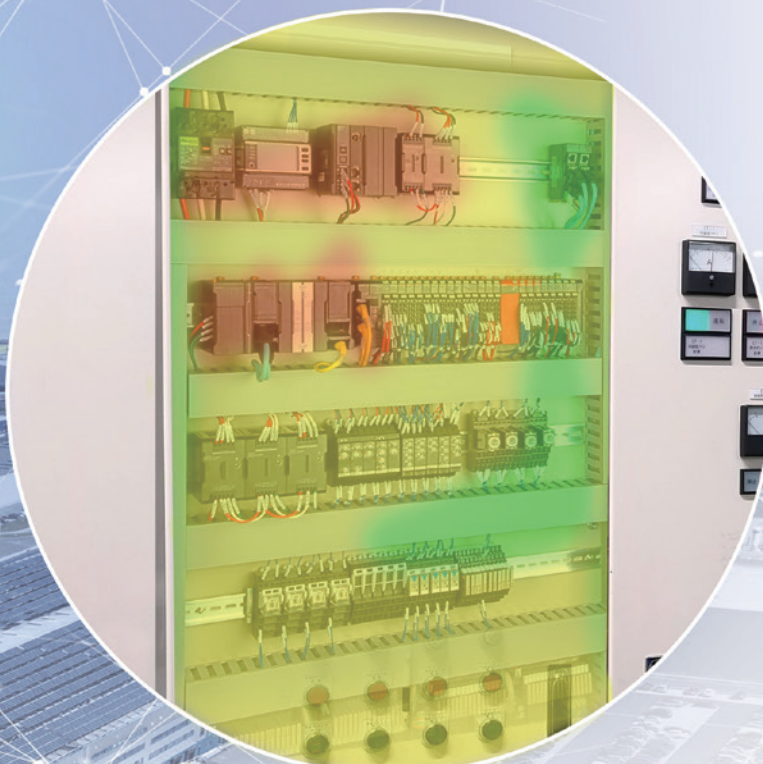
### Labor-saving and maintenance-hours reduction

Constant and remote monitoring of the temperature status is available, on-site maintenance is needed only when an abnormal occurs.

### Predictive maintenance

A prediction of temperature deviation over time provides early detection of an abnormal tendency and scheduled maintenance.



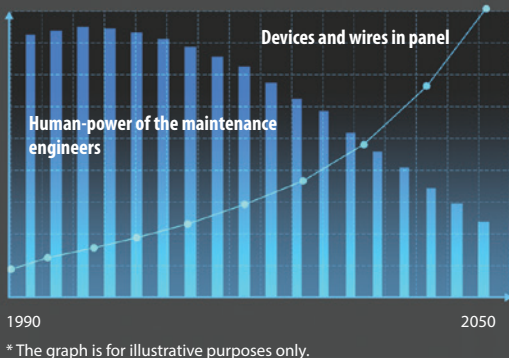


Note. This product is designed for monitoring of abnormal modes resulting , not for detecting a fire without any fault.

# Automatic capture of temperature deviation in a panel labor-saving and significant risk mitigation of abnormal

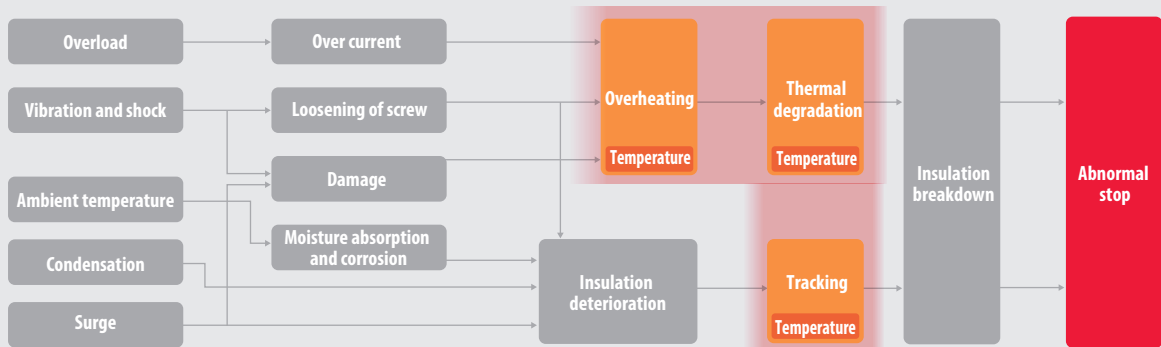
## Issues on site

Parts to check are increasing as devices and wires in a panel increase for high-functioned facilities and equipment. On the other hand, maintenance frequency is decreasing due to shortage of the maintenance engineers, resulting in a higher risk of accident.



## Importance of the temperature monitoring

Device failures have various causes; most of which leads to insulator breakage due to overheating, resulting in an abnormal stop.



Most of the abnormal modes show symptoms in the temperature deviation.

## Current way of maintenance





- A few skilled maintenance engineers manually check relying on their experiences.
- Their checking scope covers only a part of the panel, making it impossible to constantly monitor the status of whole panel.

### Measurement method of the temperature in a panel

No constant measurement method is available for temperatures in a whole panel.

### Collecting and analyzing method of temperature data

Know-how of skilled engineers is necessary, only partial data can be collected.

	A part of the panel	Whole panel
Constant monitoring	One-point monitoring with a thermocouple 	
Periodic monitoring	Terminal cap for exothermic monitoring 	Thermo viewer 



# for maintenance labors, to achieve both stop

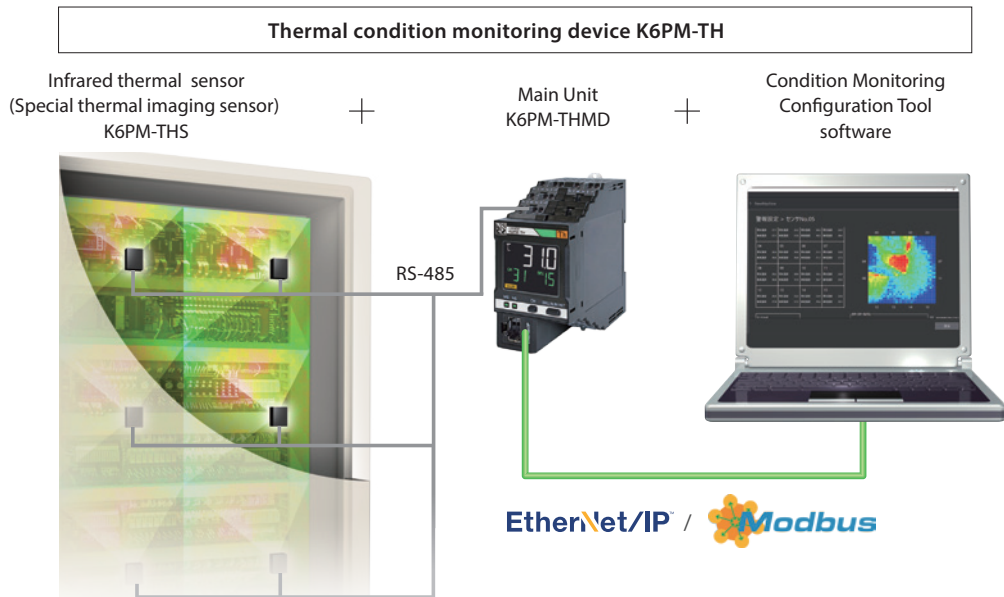
**New way of maintenance**

- Covering the skilled maintenance engineers, the thermal condition monitoring device constantly monitors temperatures of the whole panel.
- Automated collection and analysis of the temperature data enables to identify a device failure automatically.



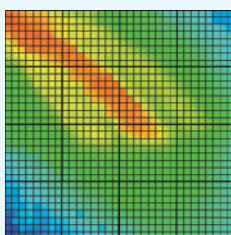
Constant measurement is possible for temperatures in the whole panel.

Identifying an abnormal part by automatic analysis, without help from skilled engineers.

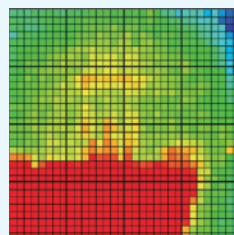


## Measurement applications using K6PM-TH

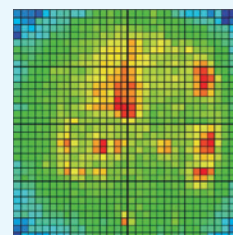
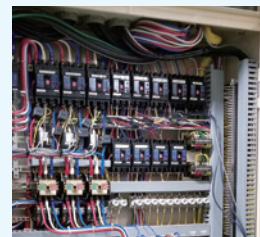
An abnormal exothermic of wiring



An abnormal exothermic of a transformer



An abnormal exothermic of devices in a panel

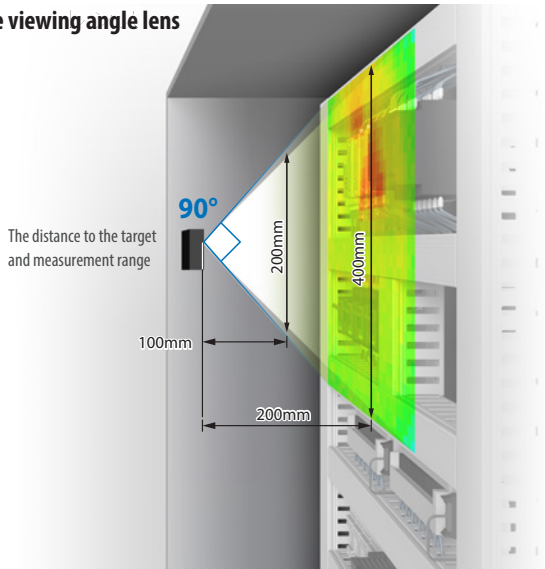


Our shared Value Design for Panel (herein after referred to as "Value Design") concept for the specifications of products used in control panels will create new value to our customer's control panels.

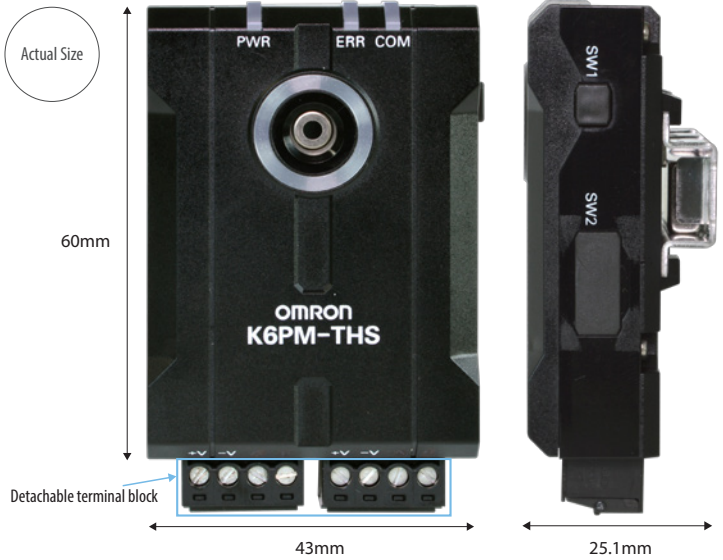
# Visualizing the temperature in a panel accurately without opening the panel door

**Optimal installation regardless of the locations thanks to the wide viewing angle and the compact body.**

### Wide viewing angle lens

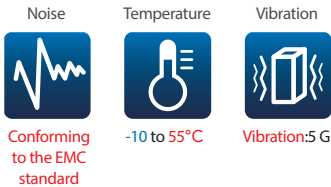


### Compact Infrared temperature sensor (Special thermal Imaging sensor) K6PM-THS



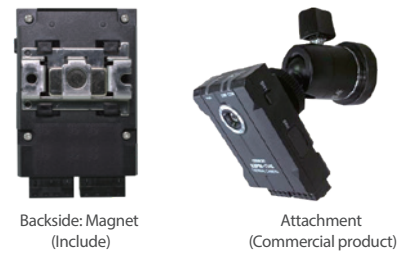
### Environmental resistance

Assuring a normal operation under a harsh environment

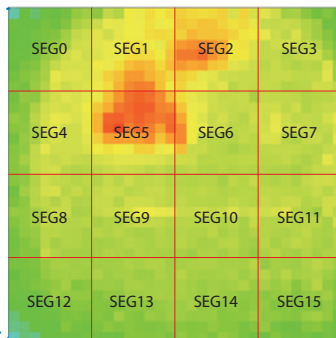


### Easy mount

Mount with a magnet or a commercially attachment on the backside of the door is available.



### Identifying an abnormal device by segmenting the thermal image.



Threshold can be set to each segment of a 16-split thermal image

The resolution of a thermal image is shown as 32 × 32 cells.



Up to 31 K6PM-THS sensors can be connected with a main unit.

### Three-step indication for the temperature status



Main Unit

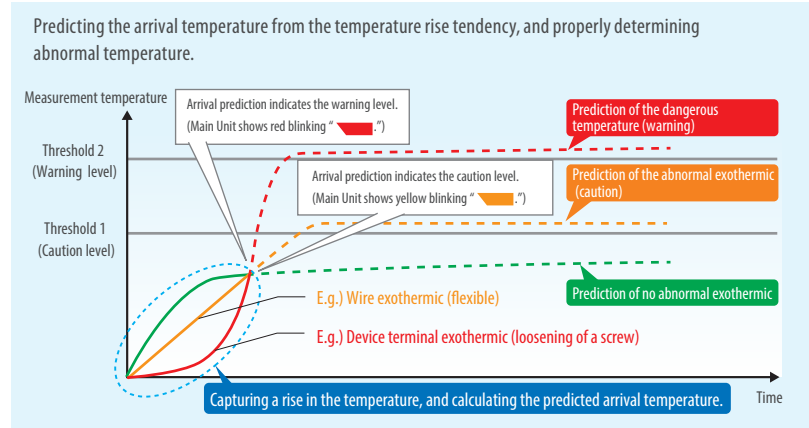
# Contributing to an early detection of abnormality by our proprietary algorithm

## Features 1 Predicting the temperature rise deviations, and notifying the dangerous level of abnormal exothermic.

### Issues on maintenance at sites

Even a stable temperature of the device can lead to a serious abnormality over time depending on the cause of abnormality; however, analysis including history of temperature variation is very difficult with non-continuous temperature monitoring.

### Solution! Arrival prediction algorithm **PATENT PENDING**\*

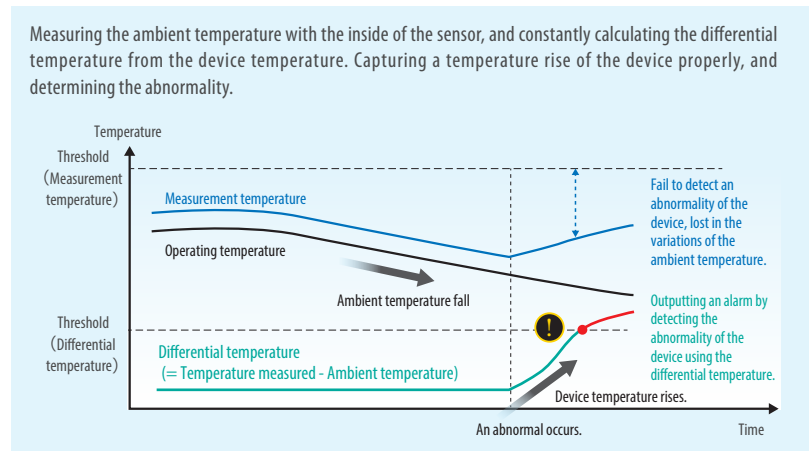


## Features 2 Enable to predict an abnormal exothermic of the devices in an environment where the ambient temperature significantly varies.

### Issues on maintenance at sites

Unable to calculate the accurate temperature variation of a device measured under an environment to be affected by an outside air temperature.

### Solution! Differential temperature detection algorithm **PATENT PENDING**\*

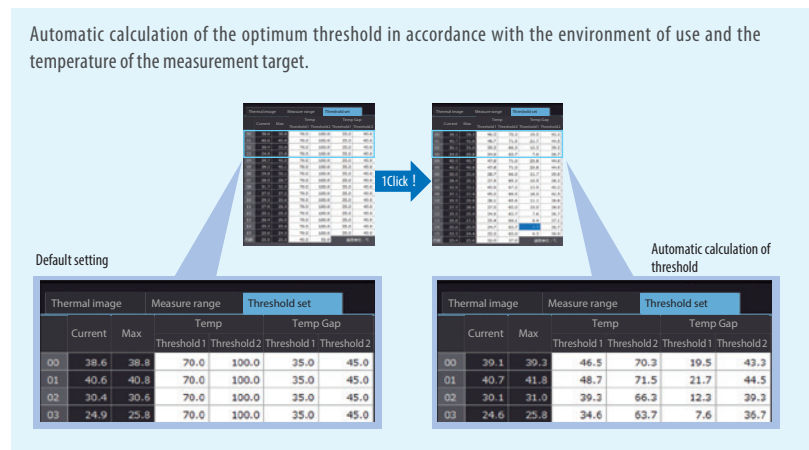


## Features 3 Auto setting of the optimum threshold for the complicated temperature distribution in a panel.

### Issues on maintenance at sites

Inexperienced maintenance engineers do not know the optimum temperature threshold for each device in a panel.

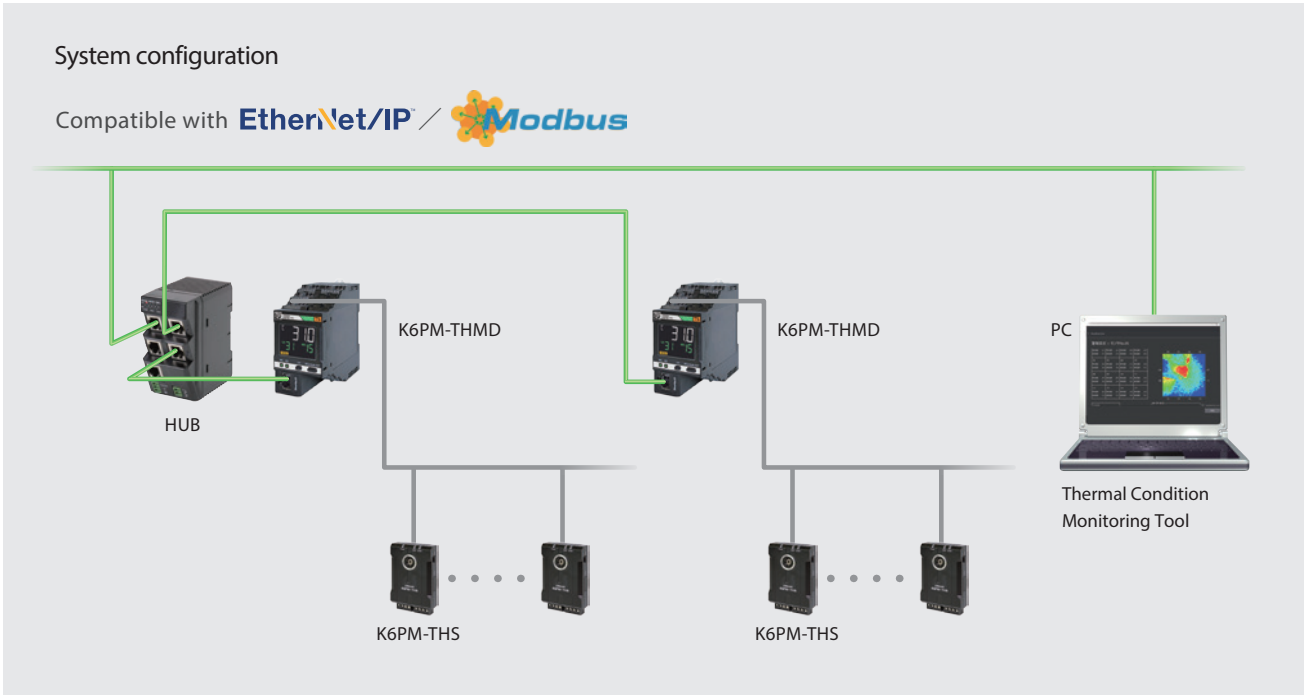
### Solution! Auto threshold set algorithm **PATENT PENDING**\*



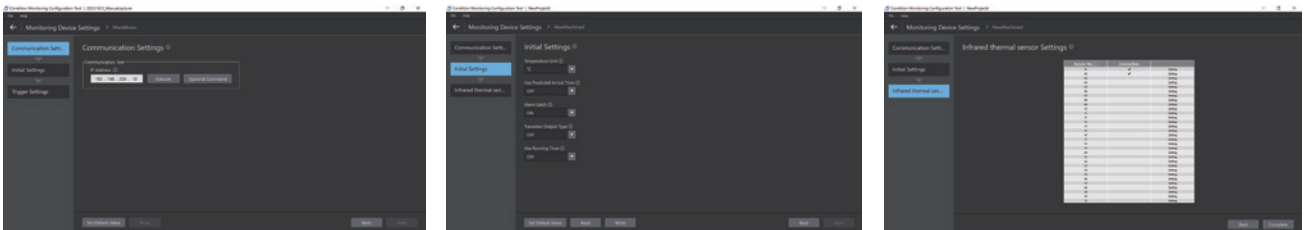
Note: The above-shown pictures might be different from the actual ones.  
\* As of 2019 May

# System configuration and software tool

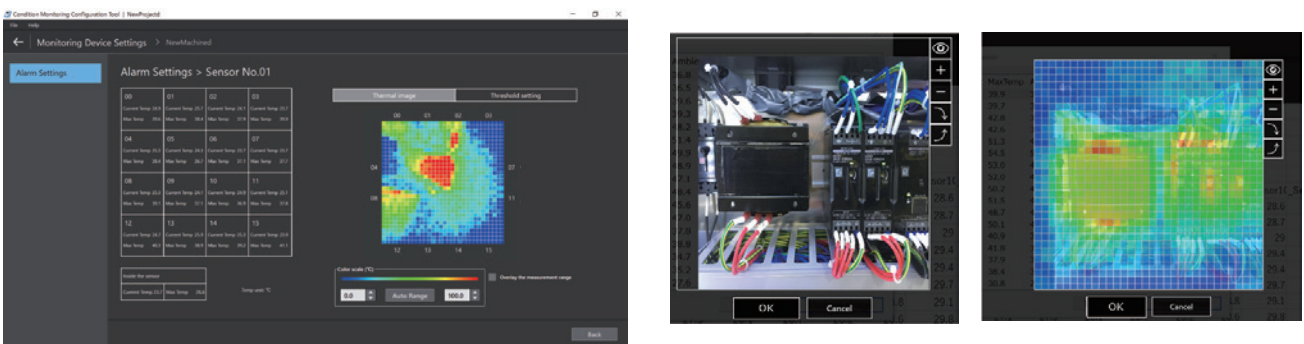
"Condition Monitoring Configuration Tool software" enables the setting and logging of K6PM-TH. K6PM-TH linked with a PC via an Ethernet cable enables you to recognize the temperature status in panels and warning alarms at one view on a remote PC.



**Only 3 settings to start; Communication setting, Initial setting, and infrared thermal sensor setting.**



**Quickly know the analyzing results of the measurements at one view**



Confirm the temperature status by simultaneously displaying the temperature data and thermal image. Easily identify the device which is outputting an alarm.

Quickly confirm the exothermic part by overlapping a thermal image on the photographed image.\*

\* The photographed image should be captured by customers.





**Note: Do not use this document to operate the Unit.**

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